SIGMAZINC 160

(SIGMA TORNUSIL MC 60)

5 pages

March 2007
Revision of November 2006

DESCRIPTION

two component moisture curing inorganic zinc (ethyl) silicate primer

PRINCIPAL CHARACTERISTICS

- anticorrosive primer for structural steel
- two component product consisting of clear binder and zinc paste
- suitable as a system primer in various paint systems based on unsaponifiable binders
- galvanic action eliminates sub film corrosion
- can withstand substrate temperatures from -90°C up to +400°C, under normal atmospheric exposure conditions
- when suitably topcoated provides excellent corrosion protection for steel substrates up to +500°C
- good low temperature curing
- good impact and abrasion resistance
- complies with SSPC-Paint 20

COLOURS AND GLOSS

greenish grey - flat

BASIC DATA AT 20°C

(1 g/cm³ = 8.25 lb/US gal; 1 m²/l = 40.7 ft²/US gal)
(data for mixed product)

Mass density	2.3 g/cm³
Volume solids	65 ± 2%
VOC (supplied)	max. 218 g/kg (Directive 1999/13/EC, SED) max. 503 g/l (approx. 4.2 lb/gal)
Recommended dry film thickness	– when used as a system primer with dft 60 µm on smooth, non pitted, blast cleaned steel – average dft 100 µm with a minimum of 75 µm on rough or pitted, blast cleaned steel
Theoretical spreading rate	8.7 m²/l for 75 µm *
Touch dry after	30 min. at 20°C
Overcoating interval	min. 12 hours * max. unlimited, zinc salts must be removed
Curing time	12 hours *
	(data for components)
Shelf life (cool and dry place)	at least 6 months

* see additional data

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RECOMMENDED SUBSTRATE CONDITIONS AND TEMPERATURES

– **for water immersion exposure:**
  - steel; blast cleaned to ISO-Sa2½, blasting profile (R_z) 40 - 70 µm
  - steel with approved zinc silicate shop primer; sweep blasted to SPSS-Ss, welds, rusty and damaged areas blast cleaned to ISO-Sa2½

– **for atmospheric exposure conditions:**
  - steel; blast cleaned to ISO-Sa2½, blasting profile (R_z) 40 - 70 µm
  - steel with approved zinc silicate shop primer; pretreated to SPSS-Pt3
  - weathered galvanised steel; blast cleaned to remove rust, to roughen the surface and to remove any zinc salts which might be present

– substrate temperatures from -5°C up to +50°C during application are acceptable
– substrate temperature should be at least 3°C above dew point
– a relative humidity of > 50% is recommended

INSTRUCTIONS FOR USE

mixing ratio by volume: paste to binder 64.5 : 35.5

– use a mechanical mixer
– stir the paste thoroughly before adding the binder
– add the binder gradually to the paste
– stir thoroughly till homogeneous
– **do not mix in reverse order**
– strain mixture through a 30 - 60 mesh screen
– agitate continuously during application
– agitate continuously during application (low speed)
  The use of a dedicated pump with a constant agitation for a zinc silicate coating is recommended.

Note: At application temperature above 30°C addition of max 10% by volume of Sigma thinner 90-53 may be necessary.

Pot life: 12 hours at 20°C *
* see additional data

AIRLESS SPRAY

Recommended thinner	Sigma thinner 90-53
Volume of thinner	0 - 10%, depending on required thickness and application conditions
Nozzle orifice	approx. 0.48 - 0.64 mm (= 0.019 - 0.025 in)
Nozzle pressure	15 MPa (= approx. 150 bar; 2130 p.s.i.)

a dedicated pump for a zinc silicate coating with constant agitation must be used

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AIR SPRAY

Recommended thinner	Sigma thinner 90-53
Volume of thinner	0 - 10%, depending on required thickness and application conditions
Nozzle orifice	2 mm
Nozzle pressure	0.3 MPa (= approx. 3 bar; 43 p.s.i.)

BRUSH

only for touch up and spot repair

Recommended thinner	Sigma thinner 90-53
Volume of thinner	5 - 15%

apply a visible wet coat with a max. dft of 25 µm
same for subsequent coats in order to obtain the required dft

CLEANING SOLVENT

Sigma thinner 90-53

UPGRADING DFT

only valid for spray application
if the dft is below specification and an extra coat of SigmaZinc 160 has to be applied, SigmaZinc 160 should be thinned down with 25 - 50% Sigma thinner 90-53, in order to obtain a visible wet coat that remains wet for some time

SAFETY PRECAUTIONS

for paint and recommended thinners see safety sheets 1430, 1431 and relevant material safety data sheets

this is a solvent based paint and care should be taken to avoid inhalation of spray mist or vapour as well as contact between the wet paint and exposed skin or eyes

ADDITIONAL DATA

highly pigmented zinc silicate primers produce dry films with void spaces in between the particles

Film thickness and spreading rate

theoretical spreading rate m²/l	10.8	8.7	6.5	5.2
dft in µm	60	75	100	125

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Overcoating table for 50% RH and higher

substrate temperature	-5°C	0°C	10°C	20°C	30°C	40°C
minimum interval	24 hours	24 hours	18 hours	12 hours	6 hours	4 hours
maximum interval	unlimited, provided the surface is cleaned from contamination and zinc salts					

- a RH below 50% requires a much longer overcoating time
- if part of a coating system and in order to avoid possible popping effects (pinholes) SigmaZinc 160 should be sealed with approved coatings
- before entering service or overcoating, a sufficient degree of cure should be obtained
- when curing conditions are unfavourable or when reduced overcoat times are desired, curing can be accelerated 4 hours after application by:
  - wetting or soaking with water, keeping the surface wet for the next 2 hours, followed by drying
  - wetting or soaking with a 0.5% ammonia solution, followed by drying
- before overcoating with topcoats, SigmaZinc 160 should always be visibly dry and checked on sufficient curing
- for measuring of the curing, the MEK rub test according to ASTM 4752 is a suitable method: after 50 double rubs with a cloth soaked in MEK (or alternatively Sigma thinner 90-53) no dissolving of the coating should be observed

Curing table for 50% RH and higher

substrate temperature	dry to handle	full cure
-5°C	2 hours	24 hours
0°C	2 hours	24 hours
10°C	1 hour	18 hours
20°C	30 min.	12 hours
30°C	30 min.	6 hours
40°C	30 min.	4 hours

- SigmaZinc 160 is a moisture curing zinc silicate, this means that it only cures after sufficient take up of water (from the atmosphere or immersion) during and after application; it is recommended that relative humidity and temperature are measured during the curing time
- relative humidity during curing recommended to be above 50%
- adequate ventilation must be maintained during application and curing (please refer to sheet 1433 and 1434)

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Pot life (at application viscosity)

0°C	24 hours
10°C	16 hours
20°C	12 hours
30°C	6 hours

Worldwide availability

Whilst it is always the aim of SigmaKalon Marine & Protective Coatings to supply the same product on a worldwide basis, slight modification of the product is sometimes necessary to comply with local or national rules/ circumstances.
Under these circumstances an alternative product data sheet is used.

REFERENCES

Explanation to product data sheets	see information sheet 1411
Safety indications	see information sheet 1430
Safety in confined spaces and health safety	
Explosion hazard - toxic hazard	see information sheet 1431
Safe working in confined spaces	see information sheet 1433
Directives for ventilation practice	see information sheet 1434
Cleaning of steel and removal of rust	see information sheet 1490
Relative humidity - substrate temperature - air temperature	see information sheet 1650

LIMITATION OF LIABILITY

The information in this data sheet is based upon laboratory tests we believe to be accurate and is intended for guidance only. All recommendations or suggestions relating to the use of the Sigma Coatings products made by SigmaKalon Marine & Protective Coatings, whether in technical documentation, or in response to a specific enquiry, or otherwise, are based on data which to the best of our knowledge are reliable. The products and information are designed for users having the requisite knowledge and industrial skills and it is the end-user's responsibility to determine the suitability of the product for its intended use.

SigmaKalon Marine & Protective Coatings has no control over either the quality or condition of the substrate, or the many factors affecting the use and application of the product. SigmaKalon Marine & Protective Coatings does therefore not accept any liability arising from loss, injury or damage resulting from such use or the contents of this data sheet (unless there are written agreements stating otherwise).

The data contained herein are liable to modification as a result of practical experience and continous product development. This data sheet replaces and annuls all previous issues and it is therefore the user's responsibility to ensure that this sheet is current prior to using the product.

The English text of this document shall prevail over any translation thereof.

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